WADS’03 Panel

Fault Tolerance & Self Healing

Valérie Issarny

INRIA, France
What is Self Healing about?

• A new name for fault tolerance

• However,

• Fault tolerant systems have for long been:
  • Systems *fixed* at design time
    – Enforce correctness *via* rigorous design (formal methods)
  • Safety-critical systems
    – Dedicated design/software/hardware
New features of today’s systems

• Increasingly consumer-oriented
• Highly dynamic
  • Evolving user requirements
  • Evolving environment
  • Quality of service
  • Mobility

➢ The system must deliver the advertised functionality, in all situations, possibly with different levels of QoS
Self healing = Fault tolerance for dynamic systems?

- Some statements at WOSS’02
  - Dealing with imprecise specification and uncontrolled environment [Shaw]
  - Dealing with adaptation / reconfiguration [Garlan et al., Medvidovic et al.] according to the system’s dynamics
Why should adaptation be FT / SH

• Need for reconsidering the design of software systems that are dynamic in nature
  • System’s standard specification that takes into account the system’s dynamics
  • System’s correctness according to both functional behavior and provided level of QoS
  • Fault tolerance when standard specification is not met
    • Standard vs exceptional?
    • E.g., Disconnection in mobile systems